

CLAIMS

What is claimed is:

✓ 1. A method for producing an organically bonded abrasive article,
comprising the steps of:
a) combining an abrasive grain component and a phenol-based
resin component;
b) molding the combined components;
c) thermally curing the phenol-based resin component in an
atmosphere comprising humidity, wherein said atmosphere
contacts the molded components, thereby producing the
organically bonded abrasive article.

10 2. The method of Claim 1, wherein the abrasive grain component is an
alumina grain.

15 3. The method of Claim 1, wherein the phenol-based resin component
includes a phenol-based resin in liquid form.

4. The method of Claim 1, wherein the phenol-based resin component
includes a resole.

5. The method of Claim 4, wherein the resole is dissolved in water.

20 6. The method of Claim 1, wherein the phenol-based resin component
includes a novolac resin.

✓ 7. The method of Claim 1, wherein the method comprises combining the

abrasive grain component, the phenol-based resin component and an organosilicon component.

8. The method of Claim 7, wherein the abrasive grain component is combined with the organosilicon component to form organosilicon-treated abrasive grain and then combined with the phenol-based resin component.

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9. The method of Claim 8, wherein the organosilicon-treated abrasive grain is first combined with a phenol-based resin in liquid form and then with a phenol-based resin in powder form.

10 10. The method of Claim 7, wherein the organosilicon component is combined with the phenol-based resin component and then with the abrasive grain.

11. The method of Claim 1, wherein thermal curing is at a final cure temperature of at least about 150 °C.

15 12. The method of Claim 1, wherein said atmosphere further includes air.

13. The method of Claim 1, wherein said atmosphere further includes ammonia.

14. The method of Claim 1, wherein thermal curing is conducted in the presence of steam.

20 15. The method of Claim 14, wherein thermal curing is conducted in the presence of live steam.

16. The method of Claim 15, wherein thermal curing is conducted in a chamber and the steam is re-circulated through the chamber.

17. The method of Claim 1, wherein said atmosphere is present for a period of at least 5 hours.

5 18. The method of Claim 1, wherein said atmosphere contacts the combined components prior to thermally curing the phenol-based resin component.

19. The method of Claim 1, wherein the thermal curing is in a chamber held at a pressure exceeding atmospheric pressure.

10 20. An abrasive article produced by a method, comprising the steps of:

- a) combining an abrasive grain component and a phenol-based resin component;
- b) molding the combined components to form a green body; and
- c) thermally curing the phenol-based resin component, in an atmosphere comprising humidity, wherein said atmosphere contacts the green body, thereby producing the organically bonded abrasive article.

15 21. The abrasive article of Claim 20, wherein the method comprises combining the abrasive grain component, the phenol-based resin component and an organosilicon component.

20 22. The abrasive article of Claim 21, wherein the organosilicon component is combined with the abrasive grain component to form organosilicon-

treated abrasive grain and then with the phenol-based resin component.

23. An abrasive article produced by a process comprising the steps of:

- combining an abrasive grain component and a phenol-based resin component;
- molding the combined components to form a green body; and
- thermally curing the phenol-based resin component, in an atmosphere comprising humidity, wherein said atmosphere contacts the green body, thereby producing the organically bonded abrasive article, said abrasive articles having an ammonia content is of less than about 50 ppm.

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24. The abrasive article of Claim 23, further including the steps of combining the abrasive grain with an organosilicon component.

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25. The abrasive article of Claim 24, wherein the abrasive grain is combined with the organosilicon component and thereafter with the phenol-based resin component.

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26. The abrasive article of Claim 23, further including the step of measuring the amount of ammonia present in the wheel by Kjeldahl nitrogen gas analysis.

27. A grinding wheel produced by a process, comprising the steps of:

- combining an abrasive grain component and a phenol-based resin component;
- molding the combined components to form a green body; and
- thermally curing the phenol-based resin component, in an atmosphere comprising humidity, wherein said atmosphere

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contacts the green body, thereby producing the organically bonded abrasive article, whereby the wheel has a strength retention greater than about 57 percent.

28. The abrasive article of Claim 27, wherein the method comprises
5 combining the abrasive grain component, the phenol-based resin component and an organosilicon component.

29. The abrasive article of Claim 28, wherein the organosilicon component is combined with the abrasive grain component to form organosilicon-treated abrasive grain and then with the phenol-based resin component.
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